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(72)*

The tubificid fauna (Oligochaeta, Tubificidae) of the Far Eastern seas of the USSR

by N.P. Finogenova

(Zoological Institute of the USSR Academy of Sciences, Leningrad, 199164)

In 1967, the Institute of Marine Biology of the Far Eastern Scientific Centre of the USSR Academy of Sciences (DVNTs AN SSSR) began conducting regular comprehensive investigations of the littoral zone of the Far Eastern seas. The first data on the oligochaetes of the region are from that period. Among other things, N. M. Shurova [1972, 1974, 1977, 1978, 1979] described the abundant fauna of enchytraeids, and recently we began to study the tubificids as well. We have described the new species and genus Ainudrilus oceanicus [Finogenova, 1982a] from the littoral of the Kuril Islands, the new species Aktedrilus longitubularis [Finogenova, Shurova, 1980] from the Sea of Japan, and the new subspecies Monopylephorus rubroniveus iturupi, M. irroratus orientalis and Rhizodrilus pacificus kurilensis [Finogenova, 1982b) from the Sea of Okhotsk.

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This paper contains new data on the tubificids of the Sea of Okhotsk and the Pacific coast of the Kuril Islands. The holotypes of the new species are found at the Zoological Institute of the USSR Academy of Sciences (Leningrad).

Subfamily Phallodrilinae

Phallodrilus timmi Finogenova, sp. n.

(fig. 1)

Holotype No. 1/45725 (a series of anatomical sections). Type locality: Kuril Islands, Paramushir Is., 300 m north of the Utesnyi pier, sampling for Fucus+Monostroma, middle horizon of littoral, 3 September 1967 (fragment).

Description. Setae forked only, upper tooth shorter and thinner than lower one. Two-four setae per bundle in front of clitellum, 1-3 behind it. Nodulus indistinct, in distal half with setae. Six single-toothed penial setae in ventral bundles of segment XI. Bundle of penial setae arranged across body. Length of usual setae 45-55 μm, thickness 3 μm; penial setae 75 μm long and 4-5 μm thick. Epidermis covered with verrucose glandular formations arranged in the form of rings, 3-6 in anterior segments and 6-8 in posterior ones. Pharyngeal glands in segment III, oesophageal glands in segments IV—1/3 VI. Chloragogue tissue begins from segment VI. Intestine developed normally.

Clitellum indistinct. Spermathecal pores in line of ventral setae near dissepiment 9/10, male genital pores in segment XI in line of ventral setae. Testes attached on dissepiment 9/10 in segment X, ovaries on dissepiment 10/11 in segment XI. Vas deferens longer than atrium, falls into latter apically, not muscular.

transparent, 15 μm wide; lumen of vas deferens 5 μm wide. Atrium abbreviated, pyriform, slightly comma-shaped, with a narrow ciliated canal and a very thin outer lining of muscles. Each atrium receives two large prostatic glands with thick stalks; anterior gland located at point of entry of vas deferens, posterior gland slightly more ectal (fig. 1, A,B). No penis. Atrium 100 μm long, 45-50 μm wide in the widest ental part; atrial canal 5 μm wide.

Spermathecae with comparatively long (up to 85 μm) and wide (50 μm) ducts with thick (10-20 μm) walls. Spermathecal ampullae differ in size; one is large, oval (width 90 μm, length 170 μm), filled with structureless secretion; the second is half the size of the first, with a ball of spermatozoa inside (fig. 1, C).

Body length of a nearly whole specimen 4.5 mm, thickness in clitellar region 325 μm, number of segments 32.

Comparison. The new species is similar to P. rectisetosus deminutius, described by Erseus [1979] from the coastal waters of Florida and the Bermuda Islands, in the form of the setae, the structure of the male gonoduct (vas deferens longer than atrium, atrium with thin external muscular layer) and body dimensions, but it is distinguished from this species by the number and size of the setae (fewer setae per bundle and setae smaller in P. rectisetosus), the location of the posterior prostate (more caudal in P. rectisetosus, than in P. timmi), the dimensions of parts of the gonoduct (vas deferens and atrium narrower and atrium shorter in P. rectisetosus deminutius) and by the form of the atrium (spindle-shaped in P. rectisetosus deminutius).

Distribution. So far limited to type locality.

Subfamily Tubificinae

Clitelloides Finogenova, gen. n.

Type species Clitelloides poseidonicus Finogenova, sp. n.

Setae forked only. Spermathecal and penial setae, as well as large coelomocytes lacking. Nephridia typical of tubificids.

Paired spermathecae open in segment X, paired male gonoducts in segment XI. Vasa deferentia long, but several times shorter than atria, consist of a narrow part adjacent to funnel, and an expanded part; vasa deferentia fall into atria apically. Atria in the form of long narrow tubes, narrow sharply ectally and end in true penises in penial sacs. Penises perpendicular to ectal part of atrial tubes. No prostatic cells or prostatic glands. Like vasa deferentia, atria ciliated inside. Vasa deferentia and atria covered with thick layer of diagonal muscles. Atrial wall differs histologically from wall of vas deferens in the granular structure of its epithelium. Vermiform spermatozeugmata found in spermathecae.

The new genus is closest to the genus Clitellio; it is distinguished from the latter by the relative dimensions of the atria (atria several times longer than vasa deferentia), the structure of their distal part (narrowing of atrial tube, location of penis), and by the presence of a thick muscular lining of the vas deferens and atrium.

Clitelloides poseidonicus Finogenova, sp. n. (fig. 2)

Holotype No. 1/45723 (a series of anatomical sections of anterior ten segments, a series of anatomical sections of male

gonoduct, an alcohol-preserved prepared male gonoduct, spermatheca and postclitellar fragment).

Type locality: Sakhalin Is., near Pil'tun Bay, depth 103 m, (75)
silted sand, "Poseidon" research vessel, 16 July 1978, collected by V.N. Koblikov; fragment of a mature specimen.

Description. Surface of body smooth. Setae forked only,
similar in dorsal and ventral bundles; upper tooth shorter (76)
than lower one (fig. 2, A,C). 5-6 setae per bundle in segments II-V, 2-4 setae in segments VI-X, one seta, more commonly 2, behind clitellum. No ventral setae in segment XI. Nodulus small, in distal half. Setae 65-80 μm long.

Pharyngeal glands in segment III, oesophageal glands in segments IV-VI. Chloragogue tissue begins from segment VI. No oesophageal diverticula. Dissepiments large, particularly well-developed above intestine; dissepiments 30-40 μm thick. Nephridia developed from segment VII, some segments without them.

Clitellum on segments 1/2 X-XII. Male genital pores in segment X, in line of ventral setae; spermathecal pores in segment X, slightly more laterad bundle of setae.

Sperm funnels large. Vasa deferentia quite long, but approximately 4 times shorter than atria. Vasa deferentia narrow near funnel, widen sharply farther on, fall into atria apically. Long tubular atria end in true penises enclosed in penial sacs. At the point where it passes into penial part, atrial tube narrows and approaches penial sac not apically, but from the side, though the duct retains its apical position. Thus, the penial sacs are perpendicular to ectal part of atrial tube (fig. 2, C,C). No prostatic

cells or glands. Atria ciliated inside similar to vas deferentia. Vasa deferentia and atria with thick layer of diagonal muscles on the outside (fig. 2, D,E). Internal epithelium of vas deferens thin, atrium thick and consists of cells with granular structure (fig. 2, E). Dimensions of parts of gonoduct: narrow part of vas deferens 15-30 μm thick and 350 μm long, wide part of vas deferens 50-70 μm thick and 700 μm long; atrium 3900 μm long and 90-100 μm wide; penis 70 μm wide at ental end, and 60 μm wide at ectal end.

Spermathecae consist of tubular ampullae and fairly long efferent ducts (fig. 2, F). Dimensions of spermatheca: ampulla in ental part 162 μm wide and 978 μm long; efferent duct 57.5-92 μm thick in narrow part and 138 μm thick in wide part, about 560 μm long. One spermatheca contained a structureless formed secretion, the other contained narrow vermiform spermatozeugmata similar to those of Tubifex tubifex (fig. 2, G).

Length of fragment of worm (37 segments) 15 mm, width 300 μm.

Distribution. So far limited to type locality.

Clitellio saxosus Finogenova sp. n. (fig. 3)

Holotype No. 1/45724 (a series of anatomical sections). Type locality: Kuril Islands, Paramushir Is., 300 m north of Utesnyi pier, upper horizon of littoral, 3 September 1967; sexually mature specimen. Paratype (No. 2/45724, mature specimen), same location.

Description. Setae forked, occasionally single-toothed. Setae in preclitellar segments mostly with equal teeth, but upper one thinner; upper tooth sometimes shorter than lower one.

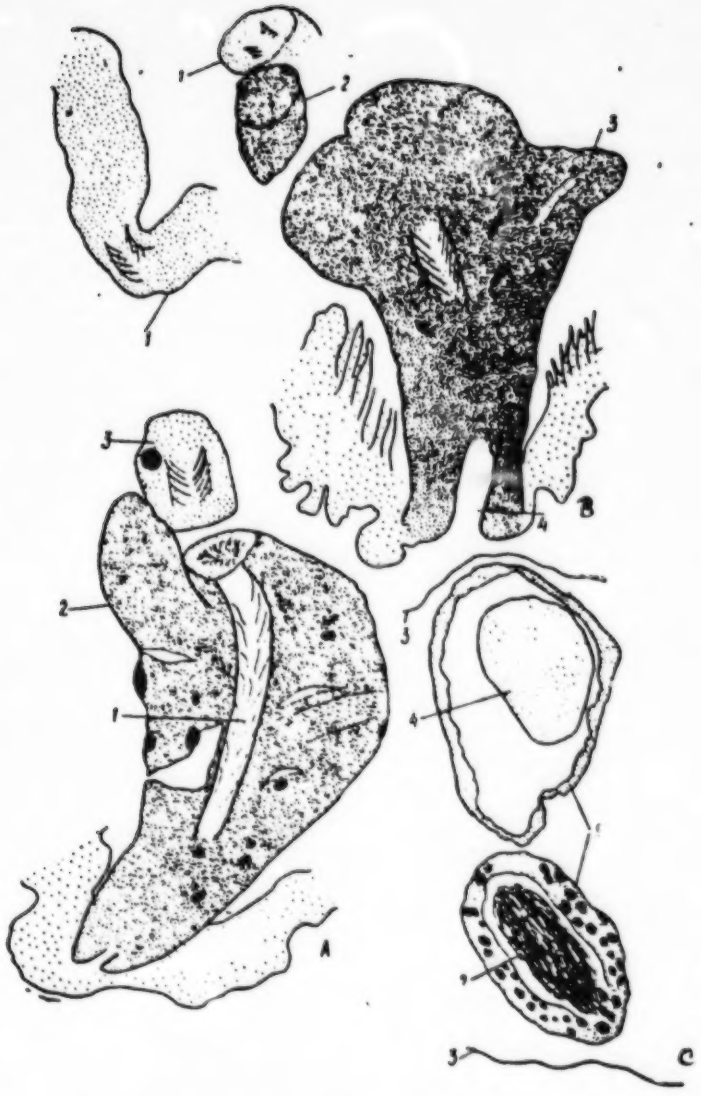

Fig. 1. Phallodrilus timmi sp. n.

A - section through atrium at point of entry of anterior prostate: 1 - atrial canal, 2 - stalk of anterior prostate, 3 - vas deferens; B - section through atrium at point of entry of prostates: 1 - vas deferens, 2 - stalk of anterior prostate, 3 - stalk of posterior prostate, 4 - male genital pore; C - section in region of spermathecal ampullae: 1 - spermathecal ampullae, 2 - spermatozoa, 3 - dissepiment, 4 - structureless secretion

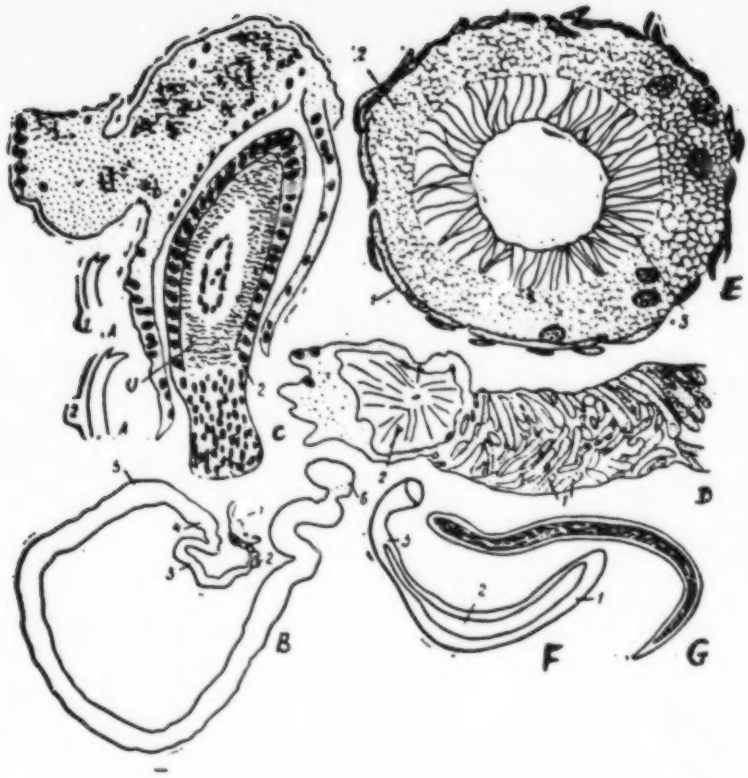

Fig. 2. Clitelloides poseidonicus gen. n., sp. n.

A - setae: 1 - ventral from segment X, 2 - from middle part of body; B - male gonoduct: 1 - sperm funnel, 2 - narrow part, 3 - expanded part of vas deferens, 4 - point of entry of vas deferens into atrium, 5 - atrium, 6 - penial part of atrium; C - section through penis: 1 - muscles of penis, 2 - male genital pore; D - section through expanded part of vas deferens: 1 - muscles, 2 - cilia; E - section through atrium: 1 - muscles, 2 - granular epithelium, 3 - cilia; F - spermatheca (prepared, ectal part of efferent duct torn off): 1 - ampulla, 2 - structureless secretion, 3 - efferent duct; G - spermatozeugma

Upper tooth in postclitellar segments shorter than lower one. Upper tooth in posterior segments reduced to small rudiment or absent (fig. 3, A). Anterior segments with 2-3, occasionally 4 setae per bundle, posterior segments with 1-2 setae. Nodulus in distal half of setae, inconspicuous. Setae 75-80 μm long. (77)

Pharyngeal glands in segment III, oesophageal glands in segments

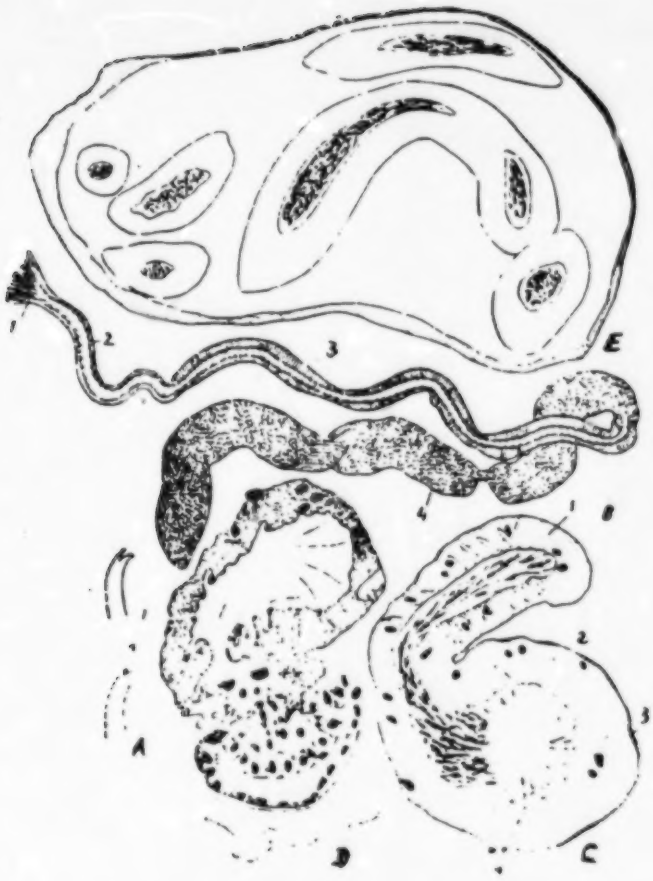

Fig. 3. Clitellio saxosus sp. n.

A – setae: 1 – ventral seta of segment VII, 2 – from posterior region of body; B – male gonoduct: 1 – sperm funnel, 2 – narrow part, 3 – expanded part of vas deferens, 4 – atrium; C – section at point of entry of vas deferens into atrium: 1 – vas deferens, 2 – granular epithelium of atrium, 3 – muscles, 4 – cilia; D – section through penis; E – section through spermathecal ampulla (inside spermatozeugma)

IV-VI. Chloragogue tissue begins from segment VI, nephridia from segment VII, but not in all the segments. Nephridia typical of tubificids. No large coelomocytes or oesophageal diverticula. Dissepiments in anterior segments thickened, 20 μm thick in front of clitellum, 3-5 μm thick in clitellum and behind it.

Clitellum in segments 1/2 X-XI. Spermathecal pores in segment X slightly laterad bundle of ventral setae, male genital pores in

segment XI in line of ventral setae. Sperm funnels small; long vasa deferentia (slightly longer than atria) consist of two parts: a thin-walled narrower proximal part and a wider thick-walled distal part. Vasa deferentia fall apically into long tubular atria with cilia inside. No prostatic cells or special prostatic glands (fig. 3, B,C). Atria terminate in small penises enclosed in penial sacs (fig. 3, D). Atrial wall composed of glandular tissue with a granular structure; glandular epithelium replaced by simple epithelium without granular structure only in penial part. Atria with a thin muscular layer on the outside. Vasa deferentia and atria extend posteriorly to segment XIV. Vas deferens and atrium narrow, sometimes quite significantly, at points where they bend or pass through dissepiment. Dimensions of male gonoduct: thin part of vas deferens 300 μm long and 22.5-25.0 μm wide, thickened part of vas deferens 875 μm long and 32.5-37.5 μm wide, lumen 10-13 μm wide, atrium 900 μm long and 30-105 μm wide, atrial wall 15-20 μm thick.

Spermathecae consist of large thin-walled ampullae and short efferent ducts. Ampullae contain vermiform spermatozeugmata (fig. 3, E). Dimensions of spermatheca: ampulla 300-425 μm long and 300-325 μm wide, efferent duct 75 μm long.

Body length 14-15.5 mm. Number of segments 69-87.

Comparison. The new species is distinguished from C. arenarius (Müller), the second known member of the genus, by the dimensions and proportions of the male gonoduct, the form of the setae (no setae with equal teeth in C. arenarius) and by the size of the body (body length 30-65 mm in C. arenarius).

Distribution. So far limited to type locality.

Remarks. At one time, the genus Tubificoides [Hrabe, 1964] was annulled, and T. heterochaetus Last. was reduced to a synonym of T. svirenkoi Jar. and transferred to the genus Peloscolex. As a result of a revision of the latter [Holmquist, 1978, 1979], the genus Tubificoides was again reestablished for T. svirenkoi (Jar.) and T. amplivasatus Erseus. R.O. Brinkhurst and H.R. Baker [1979] suggested that this genus be expanded to include P. benedeni (Udek.) (assigned by Holmquist to a separate genus, Edukemius) and a number of other, predominantly marine and brackish-water species. I agree with these authors that the genera Tubificoides and Edukemius have comparatively small differences and can be combined in a single genus, Tubificoides. However, my diagnosis of this genus differs somewhat from the one Brinkhurst and Baker give for it.

Diagnosis. Body surface covered with glandular leaf-shaped papillae; body rarely without papillae. Setae in dorsal bundles hairlike and fan-shaped, or forked only, less commonly single-toothed; setae in ventral bundles forked or single-toothed. Modified genital setae usually lacking. Vas deferens longer than atrium (sometimes several-fold), falls into atrium subapically. Prostatic gland opens into atrium opposite point of entry of vas deferens. Small, frequently bubble-like ental part of atrium ("cecum" according to Holmquist) differs histologically from the rest of the atrium in its densely granular and intensely pigmented epithelium. Atrium tubular, ends in penis enclosed in chitinous sheath. No ejaculatory duct. Penises in large penial sacs.

(79)

Tubificoides shurovae Finogenova sp. n. (fig. 4)

Holotype No. 1/45726 (a series of anatomical sections). Type locality: Sakhalin Is., neck of Pil'tun Bay, depth 1 m, silty sand, "Poseidon" research vessel, toothed scoop, 17 July 1978, collected by B.I. Sirenko. Paratypes in same locality, 44 mature and juvenile specimens.

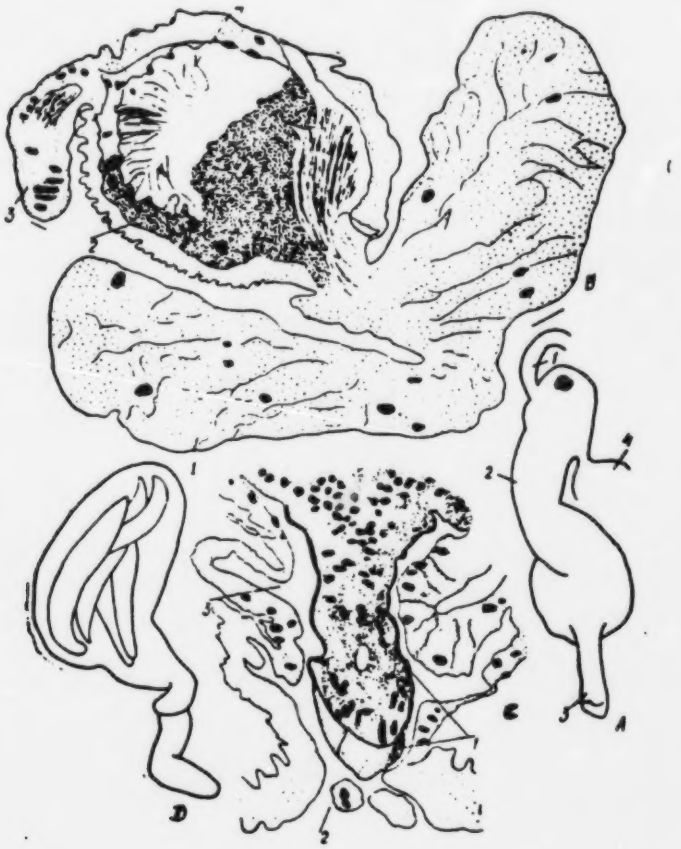

Fig. 4. Tubificoides shurovae sp. n.

A - male gonoduct (prepared): 1 - vas deferens, 2 - atrium, 3 - chitinous sheath of penis, 4 - prostatic gland; B - section through ental part of atrium: 1 - prostatic gland, 2 - glandular epithelium of ental part of atrium, 3 - vas deferens, 4 - cilia; C - section in region of penis: 1 - chitinous sheath of penis, 2 - male genital pore, 3 - penial sac; D - spermatheca with spermatozeugmata

Description. Body surface with small papillae arranged in rings. No elongated segments, all segments approximately the same. Setae forked only; teeth of equal length, but upper one thinner than lower one. 4-6 setae per bundle in anterior segments, 2-3 in segment X, 3 (less commonly 2 or 4) setae in middle of body, 1-2 in posterior segments; no ventral setae in segment XI. Nodulus at 1/3 distance from distal end. Setae 65-75 μm long in anterior and middle region of body, 45-60 μm in posterior region. Oesophageal glands in segments IV, V. Chloragogue tissue begins from segment VI. No large coelomocytes in body cavity. (80)

Clitellum saddle-shaped, in segments 1/2 X-XII. Spermathecal pores in lateral line in segment X, male pores in line of ventral setae in segment XI. Sperm funnels large. Vasa deferentia long (approximately 3 times longer than atria), with ciliated epithelium on the inside, fall into atria subapically. Large prostatic gland opens into each atrium almost opposite point of entry of vas deferens (fig. 4, A,B). Atrium in the form of tubes bent in middle part (fig. 4, A). Ental and middle parts of atria covered with layer of muscles 7.5-10 μm thick. Atrium in ental part differs histologically from remaining part in its densely granular, intensely pigmented ciliated internal epithelium (fig. 4, B). Internal epithelium of middle part of atrium consists of large granular (less densely distributed than in ental part) cubic cells which fill almost all of atrial tube, leaving only small central lumen. Atrium narrows slightly as it passes into penial part. No ejaculatory duct. Ectal part of atrium does not differ histologically from middle part. Penis in large penial sac, enclosed in thin chitinous sheath with opening at the side (fig. 4, A, C). Chitinous

parts of penis usually protrude exteriorly in fixed specimens. Dimensions of male gonoduct: thickness of vas deferens 25-30 μm, length of prepared atrium 530-550 μm, width of atrium in proximal part 110-120 μm, width of atrium in middle part 80-100 μm, width of penial sac 180-190 μm, length of chitinous penial sheath 170-185 μm, width of latter 65-75 μm at proximal end and 45-55 μm at distal end.

Spermathecae with large sacciform ampullae (ampulla 430 μm long, 240 μm wide) and long efferent ducts. Length of efferent duct 390 μm, width in middle part 60 μm. Spermatozeugmata vermiform (fig. 4, D).

Length of body 10-15 mm, thickness in clitellar region 350-400 μm. Number of segments 46-60.

Comparison. The new species is closest to T. wasselli Brinkhurst et Baker, from which it is distinguished by size (body length of T. wasselli 8 mm), the number of setae per bundle (2 in anterior bundles and 1 seta in posterior bundles in T. wasselli), a larger atrium (300-380 μm long in T. wasselli), a longer chitinous penial sheath (twice as long as width at base in T. wasselli), and by a number of other, less significant characters.

Distribution. So far limited to type locality. Encountered from the upper littoral to a depth of 3 m on silts, silted sand and clean sand.

Tubificoides pseudogaster (Dahl, 1960)

Discovered in the stony, silted littoral of the Mytilus edulis zone in Gertner Bay near Kedrovyi klyuch (Tauyskaya Guba, Sea of Okhotsk).

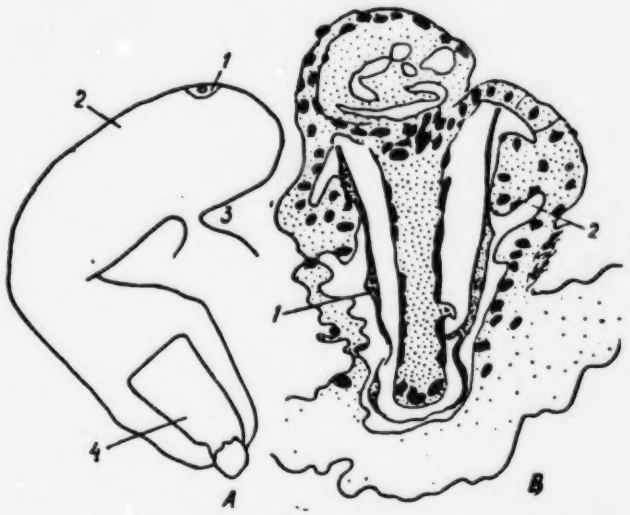

Fig. 5. T. pseudogaster (Dahl)

A - atrium: 1 - point of entry of vas deferens, 2 - ental part of atrium, 3 - prostatic gland, 4 - chitinous penial sheath; B - section through penis: 1 - chitinous penial sheath, 2 - penial sac

R.O. Brinkhurst and H.R. Baker [1979] recently noted a group of forms from Britain and North America, identified by them as T. pseudogaster, but differing from the first description and among each other. The authors do not describe these forms in full, but the characters described by them make it hard to believe that all the forms found by them belong to the given species. In order to establish the taxonomic position of these new forms, H.R. Baker [1980], using the type series from I.O. Dahl's collection, re-described this species, adding certain details to the description. As we can see from the illustrations presented by Baker, the type specimens that he had at his disposal were not mature enough. Perhaps this is why his description differs somewhat from the original. Furthermore, this species is apparently morphologically flexible. The following is a comparison of the morphological characters of our specimens and Dahl and Baker's description.

(81

Comparison of different descriptions of Tubificoides pseudogaster

Character	Description		
	Our specimens	after Dahl [1960]	after Baker [1980]
Epidermis	Without papillae, but its folds form rings	-	Without papillae
Body length	8 mm	12–13 mm	7.8 mm
No. of segments	43	50–85	51
Setae	4–6 per bundle in front of clitellum, 2–3 behind clitellum; upper tooth slightly longer than lower one; setae 55–64 µm long	4–6 per bundle in anterior segments, 2 in posterior; upper tooth shorter or equal to lower one	(1,2) 3–5 in anterior segments, (1)–2 in posterior; upper tooth equal to or slightly longer than lower one; setae 50–70 µm long
Dissepiments	3/4–8/9 thickened to 25 µm	3/4–8/9 thickened	-
Intestine	Expanded in segment IX	Glandular structures in segment IX	Enlarged in segment IX
Circulatory system	Lateral hearts in segments VIII and IX	Lateral heart in segment VIII, segment IX with vascular flexus in which second pair of hearts develops	Vessels noticeable in segments IV–VII
Sperm funnels	Large	Large	Large
Vas deferens	Several times longer than atrium, fall into latter subapically, 17.5–25 µm thick	Long	About 3 times longer than atrium, falls into latter subapically, 16.7–17.2 µm thick
Atrium	Curved, consists of ental, slightly swollen part with finely granular internal epithelium, tubular middle part composed of large cubic cells; distal part histologically indiscernible from middle part; atrium 325 µm long, 240 µm to base of chitinous sheath, width at prostate entry 85 µm, in middle part 55 µm, at point of transition to penial part 25 µm; large prostatic gland enters opposite point of entry of vas deferens, penis in large penial sac, with slightly conical chitinous sheath, 85–87.5 µm long, 47.5 µm wide in proximal part, 32–35 µm in distal part; small collar present (fig. 5), opening from the bottom	With large prostatic gland; thin penial tube present, 85 µm long, 37 µm wide; distally, penial tube with exteriorly curved collar (similar to tube of L. udekemianus, but smaller and with thinner walls)	With finely granular swollen head, middle tubular part composed of large cuboidal cells and distal part composed of small cells; length of atrium to base of penial sheath 170 µm, width at base of head 37 µm; large prostatic gland falls into atrium opposite point of entry of vas deferens; penis with cuticular sheath in deep, slightly conical penial sac, 52 µm long, 34 µm wide at base

(table continued)

Character	Descriptions		
	Our specimens	after Dahl [1960]	after Baker [1980]
Spermatheca	With large sacciform ampulla and long and wide efferent duct in ental part: spermatozeugmata spindle-shaped	With spherical ampulla and comparatively wide efferent duct; spermatozeumata spindle-shaped	With small ampulla and long efferent duct, ampullae empty

(83) Our specimens are similar to those described first, and are distinguished from them by smaller dimensions, partly by the form of the setae, and by a slightly wider penial sheath.

Spirosperma piltuni Finogenova sp. n. (fig. 6)

Holotype No. 1/45727 (a series of anatomical sections). Locality: Sakhalin Is., neck of Piltun Bay, depth 1.2 m, sand, silt, "Poseidon" research vessel, 17 August 1978, collected by B.I. Sirenko; fragment. Paratypes - same locality.

(84) **Description.** Prostomium small, triangular. Cuticular sheath very poorly developed, epidermal papillae barely discernible. Setae in dorsal and ventral bundles forked only, with upper tooth longer than lower one and with distal nodulus (fig. 6,A). 3-5 (rarely 6) setae per bundle in front of clitellum, 2-3 (rarely 4) per bundle behind clitellum; ventral bundles in segment X each contain one spermathecal seta ("hammoniensis"-type in form); no ventral setae in segment XI. Setae 45.0-57.5 μm long. Dissepiments thickened (16-20 μm) in preclitellar segments.

Clitellum on segments 1/2 X-XI. Spermathecal pores in line of ventral setae of segment X located slightly more laterad spermathecal setae. Male pores open in line of ventral setae of segment XI. Male funnels moderately large. Vasa deferentia long, contorted, gradually thicken, open apically in atrium (fig. 6, B).

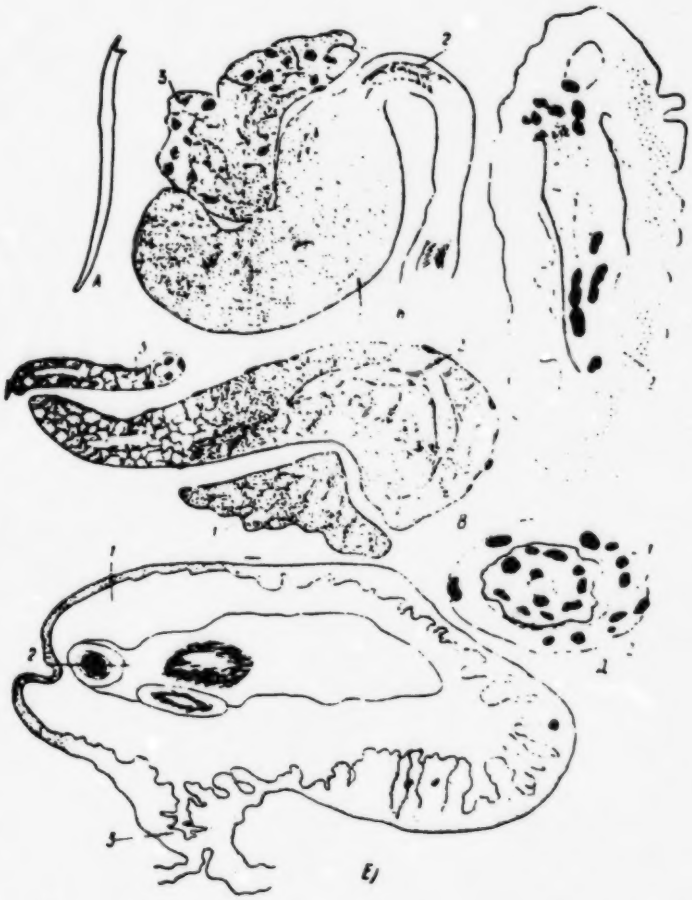

Fig. 6. Spirosperma piltuni sp. n.

A - seta; B - section at point of entry of vas deferens into atrium: 1 - atrium, 2 - vas deferens, 3 - prostatic gland; C - ectal part of atrium: 1 - prostatic gland, 2 - atrial duct, 3 - ejaculatory duct; D - penis: 1 - chitinous penial sheath, 2 - penis proper; E - cross-section of penis: 1 - chitinous penial sheath, 2 - penis proper; F - spermatheca: 1 - ampulla, 2 - spermatozeugmata, 3 - efferent duct

Atria crescent-shaped; internal atrial canal comparatively narrow, ciliated. Duct of large prostatic gland opens approximately in middle part of atrium (slightly closer to ental end) from concave side. In one specimen, atrial epithelium adjacent to duct of prostate characterized by granular structure of a darker colour (fig. 6, C), but atrial epithelium of another specimen with uniform granularity and colour. Narrowing gradually, atria pass into long narrow ejaculatory ducts (figs. 6, C). Small penises with thin

chitinous sheaths in the form of a cylinder with uneven walls and somewhat recurved margins at ental end located in penial sacs (fig. 6, D,E). Dimensions of male gonoduct: width of vas deferens near sperm funnel 20.0-22.5 μm, width at point of entry into atrium 30 um; thickness of atrium at point of entry of prostate 50 μm; width of ejaculatory canal in ental part 12-20 μm, in ectal part 10 μm; length of chitinous penial sheath 50 μm, width in ental part 15 μm.

Spermathecae with large oval ampulla with characteristic internal epithelium in the form of separate high cells protruding into lumen of ampulla, and with short efferent duct (fig. 6, F). Dimensions of spermatheca: width of long axis of ampulla 250 μm, width of short axis 120-140 μm; length of efferent duct 50 μm, width in ental part 35 μm. Spermatozeugmata vermiform.

Length of worm fragments 4.0 and 4.2 mm, thickness in clitellar region 300-350 μm; number of segments 15 and 17.

Comparison and remarks. The genus Spirosperma Eisen, 1879 was recently reestablished by Holmquist [1978, 1979] for several species of the genus Peloscolex. She has also reestablished the genus Embolocephalus Randolph, 1892, and on the basis of the former genus Peloscolex has established the new genus Orientodrilus. R.O. Brinkhurst [1981] slightly altered the diagnosis of Holmquist's genus Spirosperma, and also combined the genera Embolocephalus and Orientodrilus under the name Spurosperma (Embolocephalus).

The species described here bears similarities to Embolocephalus (spermathecal setae in segment X) and Orientodrilus (spermathecal setae in segment X, atrium crescent-shaped, ejaculatory duct long), and also to Spirosperma sensu Holmquist

(structure of male gonoduct). However, this species is distinguished from the members of the indicated genera by the nature of its setae (only forked setae present in dorsal bundles) and integuments (almost undeveloped cuticular sheath). True, I had no whole specimens at my disposal, and we know that the cuticular sheath is the most clearly defined in the posterior part of the body.

(85)

At the same time, S. piltuni is distinguished from the subgenus Spirosperma (sensu R.O. Brinkhurst) by the presence of spermathecal setae and the absence of hairlike and fan-shaped setae in the dorsal bundles, and it is distinguished from the subgenus Embolocephalus by the presence of a chitinous penial sheath and the absence of single-toothed setae in the ventral bundles and hairlike and fan-shaped setae in the dorsal bundles. We should probably include Embolocephalus and Orientodrilus in the genus Spirosperma, as is done by R.O. Brinkhurst, but without distinguishing any subgenera in the genus. We should also add to the diagnosis of Spirosperma that the dorsal bundles contain only forked setae.

Distribution. So far limited to type locality.

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